



# RF Test Report

**Product Name: Multi-mode Multi-carriers Remote Radio Unit**

**Product Model: RRU3642-800**

**Report Number: SYBH(R)00633714EB-1**

**FCC ID: QISRRU3642-800M**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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## Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-1 and 6369A-3.
5. The laboratory has been listed by the VCCI to perform EMC measurements. The accreditation numbers of test site No.1 are R-2364, G-415, C-2583, and T-256, and the accreditation numbers of test site No.2 are R-3760, G-485, C-4210 and T-1237.
6. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
7. The test report is invalid if there is any evidence of erasure and/or falsification.
8. The test report is only valid for the test samples.
9. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.



**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, P.R.C  
**Product Name:** Multi-mode Multi-carriers Remote Radio Unit  
**Product Model:** RRU3642-800

**Date of Receipt Sample:** 2012-05-26  
**Start Date of Test:** 2012-05-26  
**End Date of Test:** 2012-06-11

**Test Result:** Pass

<b>Approved by Senior Engineer:</b>	2012-07-16	Zhang Xinghai	<i>Zhang Xing hai</i>
	Date	Name	Signature

<b>Prepared by:</b>	2012-07-16	Hu Wei	<i>Hu Wei</i>
	Date	Name	Signature



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**Modification Record**

No.	Last Report No.	Modification Description
1	---	First report.



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## 1 General Information

### 1.1 Applied Standard

Applied Rules: 47CFR FCC Part 2 Subpart J(10-1-11 Edition)  
47CFR FCC Part 22 Subpart H (10-1-11 Edition)

### 1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.  
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, P.R.C

### 1.3 Test Environment Condition

Ambient Temperature: 20 to 25 °C  
Ambient Relative Humidity: 58 to 70 %  
Atmospheric Pressure: Not applicable



## 2 Test Summary

Test Case	FCC Part No.	Requirements	Result
Cellular Band			
Transmitter Output Power	2.1046 & 22.913	ERP not exceed 500 W	Pass
Modulation Characteristics	2.1047	Digital modulation	Pass
Occupied Bandwidth	2.1049	(Not specified)	Pass
Band Edges Compliance	2.1051 & 22.917	Below -13 dBm/1%*EBW, in 1 MHz range	Pass
Spurious Emission at Antenna Terminals	2.1051 & 2.917	Below -13 dBm/1 kHz, 9 kHz to 150 kHz Below -13 dBm/10 kHz, 150 kHz to 30 MHz Below -13 dBm/100 kHz, 30 MHz to 10 <sup>th</sup> harmonics	Pass
Field Strength of Spurious Radiation	2.1053 & 22.917	Below -13 dBm/100 kHz	Pass
Frequency Stability	2.1055 & 22.355	Maintained within the tolerances of $\pm 1.5$ ppm	Pass



### 3 Description of the Equipment under Test (EUT)

#### 3.1 General Description

The RRU3642-800 is an outdoor remote radio unit. It is the radio frequency (RF) part of a distributed base station and can be located near antennas. The RRU3642-800 can modulate, demodulate, combine, and divide baseband and RF signals. It also processes baseband and RF signal data. With the Software Defined Radio (SDR) technology, the RRU3642-800 supports the dual-mode operation of any two modes of CDMA and LTE through software configuration modification.

#### 3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

##### 3.2.1 Board

Board		
Board Name	Hardware Version	Description
WD5GMRXC50	VER.A	Transceiver Board
WD5GMRAC50	VER.A	Power Amplifier Board

##### 3.2.2 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
LMPT	---	Huawei	LTE Main Processing & Transmission Unit
LBBP	---	Huawei	LTE baseband Processing Unit
CMPT	---	Huawei	CDMA2000 Main Processing & Transmission Unit
HCPM	---	Huawei	CDMA2000 1X baseband Processing Unit
HECM	---	Huawei	CDMA2000 EVDO baseband Processing Unit

### 3.3 Technical Description

Characteristics	Description
Radio System Type	Single Radio Access <input type="checkbox"/> GSM Technology <input type="checkbox"/> UMTS (Single-RAT): <input checked="" type="checkbox"/> LTE <input checked="" type="checkbox"/> CDMA <input type="checkbox"/> WiMAX Multi-Standard Radio <input type="checkbox"/> GSM & UMTS (MSR): <input type="checkbox"/> GSM & LTE <input type="checkbox"/> GSM & UMTS & LTE <input type="checkbox"/> WiMAX & LTE <input checked="" type="checkbox"/> CDMA & LTE
Supported Frequency Range	Transmission (TX): 869 to 894 MHz Receiving (RX): 824 to 849 MHz
TX and RX Antenna Ports	TX & RX port: 2 TX-only port: 0 RX-only port: 2
Multiple Carrier Supported	4 (per antenna port) 8 (two antenna ports)
TX Output Power	Max. 60 W (per antenna port) Max. 120 W (two antenna ports)
Supported Channel Bandwidth	GSM system: <input type="checkbox"/> 200 kHz UMTS system: <input type="checkbox"/> 5 MHz LTE system: <input checked="" type="checkbox"/> 1.4 MHz, <input checked="" type="checkbox"/> 3 MHz, <input checked="" type="checkbox"/> 5 MHz, <input checked="" type="checkbox"/> 10 MHz, <input checked="" type="checkbox"/> 15 MHz, <input checked="" type="checkbox"/> 20 MHz CDMA system: <input checked="" type="checkbox"/> 1.23 MHz, <input type="checkbox"/> 1.25 MHz WiMAX system: <input type="checkbox"/> 5 MHz, <input type="checkbox"/> 7 MHz, <input type="checkbox"/> 10 MHz
Designation of Emissions (Note: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.)	GSM system: Not applicable UMTS system: Not applicable LTE system: 1M40D9W, 3M00D9W, 5M00D9W, 10M0D9W, 15M0D9W, 20M0D9W CDMA system: 1M23F9W WiMAX system: Not applicable
Power Supply	Power Supply Type: <input type="checkbox"/> External AC mains, <input checked="" type="checkbox"/> External DC mains, <input type="checkbox"/> AC/DC Adapter, <input type="checkbox"/> Powered over Ethernet (PoE) Nominal Voltage, -48 VDC Input to EUT: Voltage Range, -36 to -57 VDC Input to EUT:



Characteristics	Description
Antenna Assembles	Antenna Type: <input checked="" type="checkbox"/> External <input type="checkbox"/> Integrated Smart Antenna: <input checked="" type="checkbox"/> MIMO <input type="checkbox"/> Non MIMO Antenna Gain: 8 dBi (per antenna port, max.) Remark: When the EUT is put into service, the practical maximum antenna gain should NOT exceed the value as described above, and if exceed, the combination of the practical output power and the practical antenna gain should NOT exceed the required ERP/EIRP limit.



## 4 General Test Conditions / Configurations

### 4.1 Test Modes

NOTE: The test mode(s) are selected according to relevant radio technology specifications.

Test Mode	Test Modes Description
CDMA/1X	CDMA system, CDMA2000 1x mode
CDMA/EV-DO	CDMA system, CDMA2000 1x EV-DO mode
LTE/TM1.1	LTE system, 3GPP TS 36.141 clause 6.1.1, E-TM 1.1
LTE/TM1.2	LTE system, 3GPP TS 36.141 clause 6.1.1, E-TM 2
CL/TM1.1	MSR system (CDMA/1X; LTE/TM1.1)
CL /TM1.2	MSR system (CDMA/EV-DO; LTE/TM1.1)

## 4.2 EUT Configurations

### 4.2.1 General Configurations

Configuration	Description
Test Antenna Ports	Until otherwise specified, <ul style="list-style-type: none"> <li>- All TX tests are ONLY performed at the main TX antenna port (e.g. TRXA, TXA or similar) of the EUT, and</li> <li>- All RX tests are ONLY performed at the main RX antenna port (e.g. TRXA, RXB or similar) of the EUT.</li> </ul>
Multiple RF Sources	Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.

### 4.2.2 Customized Configurations

NOTE: For the carrier configurations, the description of “n\*TxxxM(yyyW)@zzz” denotes the n \* multiple carriers of the radio system type T (G - GSM system, U - UMTS system, L - LTE system, C - CDMA system, W - WiMAX system), for which the channel bandwidth of each carrier is xxx MHz (applicable for T supporting various channel bandwidths) and the power level of each carrier is yyy Watts, at the antenna port zzz (if specified). While the combinations of several “n\*TxxxM(yyyW)@zzz”s denotes the carrier configurations of the MSR system.

EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
1C_1X_B	B	1*C(60W)	870.03	---	1.23	47.78	CDMA/1 X
1C_1X_M	M	1*C(60W)	881.4	---	1.23	47.78	CDMA/1 X
1C_1X_T	T	1*C(60W)	892.74	---	1.23	47.78	CDMA/1 X
2C_1X_M	M	1*C(60W) @Ant A 1*C(60W) @Ant B	880.17/881.4	---	1.23/1.23	47.78/47.78	CDMA/1 X
3C_1X_B	B	3*C(20W)	870.03/871.26 /872.49	---	1.23/1.23 /1.23	43.01/43.01/4 3.01	CDMA/1 X
3C_1X_M	M	3*C(20W)	880.17/881.4/ 882.63	---	1.23/1.23 /1.23	43.01/43.01/4 3.01	CDMA/1 X
3C_1X_T	T	3*C(20W)	890.28/891.51 /892.74	---	1.23/1.23 /1.23	43.01/43.01/4 3.01	CDMA/1 X
4C_1X_B	B	4*C(15W)	870.03/871.26	---	1.23/1.23	41.76/41.76/4	CDMA/1



EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
			/872.49/873.72		/1.23/1.23	1.76/41.76	X
4C_1X_M	M	4*C(15W)	880.17/881.4/882.63/883.86	---	1.23/1.23 /1.23/1.23 3	41.76/41.76/4 1.76/41.76	CDMA/1 X
4C_1X_T	T	4*C(15W)	889.05/890.28/891.51/892.74	---	1.23/1.23 /1.23/1.23 3	41.76/41.76/4 1.76/41.76	CDMA/1 X
1C_1XEVD0_B	B	1*C(60W)	870.03	---	1.23	47.78	CDMA/E V-DO
1C_1XEVD0_M	M	1*C(60W)	881.4	---	1.23	47.78	CDMA/E V-DO
1C_1XEVD0_T	T	1*C(60W)	892.74	---	1.23	47.78	CDMA/E V-DO
3C_1XEVD0_B	B	3*C(20W)	870.03/871.26/872.49	---	1.23/1.23 /1.23	43.01/43.01/4 3.01	CDMA/E V-DO
3C_1XEVD0_M	M	3*C(20W)	880.17/881.4/882.63	---	1.23/1.23 /1.23	43.01/43.01/4 3.01	CDMA/E V-DO
3C_1XEVD0_T	T	3*C(20W)	890.28/891.51/892.74	---	1.23/1.23 /1.23	43.01/43.01/4 3.01	CDMA/E V-DO
4C_1XEVD0_B	B	4*C(15W)	870.03/871.26/872.49/873.72	---	1.23/1.23 /1.23/1.23 3	41.76/41.76/4 1.76/41.76	CDMA/E V-DO
4C_1XEVD0_M	M	4*C(15W)	880.17/881.4/882.63/883.86	---	1.23/1.23 /1.23/1.23 3	41.76/41.76/4 1.76/41.76	CDMA/E V-DO
4C_1XEVD0_T	T	4*C(15W)	889.05/890.28/891.51/892.74	---	1.23/1.23 /1.23/1.23 3	41.76/41.76/4 1.76/41.76	CDMA/E V-DO
1L_1M4_B	B	1*L(60W)	869.7	---	1.4	47.78	LTE/TM1. 1
1L_1M4_M	M	1*L(60W)	881.5	---	1.4	47.78	LTE/TM1. 1
1L_1M4_T	T	1*L(60W)	893.3	---	1.4	47.78	LTE/TM1. 1
1L_3M_B	B	1*L(60W)	870.5	---	3	47.78	LTE/TM1. 1
1L_3M_M	M	1*L(60W)	881.5	---	3	47.78	LTE/TM1. 1
1L_3M_T	T	1*L(60W)	892.5	---	3	47.78	LTE/TM1.



EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
							1
1L_5M_B	B	1*L(60W)	871.5	---	5	47.78	LTE/TM1.1
1L_5M_M	M	1*L(60W)	881.5	---	5	47.78	LTE/TM1.1
1L_5M_T	T	1*L(60W)	891.5	---	5	47.78	LTE/TM1.1
1L_10M_B	B	1*L(60W)	874	---	10	47.78	LTE/TM1.1
1L_10M_M	M	1*L(60W)	881.5	---	10	47.78	LTE/TM1.1
1L_10M_T	T	1*L(60W)	889	---	10	47.78	LTE/TM1.1
1L_15M_B	B	1*L(60W)	876.5	---	15	47.78	LTE/TM1.1
1L_15M_T	T	1*L(60W)	886.5	---	15	47.78	LTE/TM1.1
1L_20M_B	B	1*L(60W)	879	---	20	47.78	LTE/TM1.1
1L_20M_M	M	1*L(60W)	881.5	---	20	47.78	LTE/TM1.2
1L_20M_T	T	1*L(60W)	884	---	20	47.78	LTE/TM1.1
3C1L_1X_1M4_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/874.5	---	1.23/1.23 /1.23/1.4	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_1M4_M	M	3*C(15W) 1*L(15W)	879.57/880.8/ 882.03/884	---	1.23/1.23 /1.23/1.4	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_1M4_T	T	3*C(15W) 1*L(15W)	888.87/890.1/ 891.33/893.3	---	1.23/1.23 /1.23/1.4	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_3M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/875.5	---	1.23/1.23 /1.23/3	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_3M_M	M	3*C(15W) 1*L(15W)	878.67/879.9/ 881.13/884	---	1.23/1.23 /1.23/3	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_3M_T	T	3*C(15W) 1*L(15W)	887.07/888.3/ 889.53/892.5	---	1.23/1.23 /1.23/3	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_5M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/876.5	---	1.23/1.23 /1.23/5	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_5M_M	M	3*C(15W) 1*L(15W)	877.77/879/88 0.23/884	---	1.23/1.23 /1.23/5	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_5M_T	T	3*C(15W)	885.27/886.5/	---	1.23/1.23	41.76/41.76/4	CL/TM1.1



EUT Conf.	RF Ch	Carrier Conf. Description	TX Freq. [MHz]	RX Freq. [MHz]	Ch. BW [MHz]	Power Level [dBm]	Test Mode
		1*L(15W)	887.73/891.5		/1.23/5	1.76/41.76	
3C1L_1X_10M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/879	---	1.23/1.23 /1.23/10	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_10M_T	T	3*C(15W) 1*L(15W)	879.87/881.1/ 882.33/889	---	1.23/1.23 /1.23/10	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_15M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/881.5	---	1.23/1.23 /1.23/15	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_15M_T	T	3*C(15W) 1*L(15W)	875.07/876.3/ 877.53/886.5	---	1.23/1.23 /1.23/15	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1X_20M_M	M	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/884	---	1.23/1.23 /1.23/20	41.76/41.76/4 1.76/41.76	CL/TM1.1
3C1L_1XEVD0_1M4_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/874.5	---	1.23/1.23 /1.23/1.4	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_1M4_M	M	3*C(15W) 1*L(15W)	879.57/880.8/ 882.03/884	---	1.23/1.23 /1.23/1.4	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_1M4_T	T	3*C(15W) 1*L(15W)	888.87/890.1/ 891.33/893.3	---	1.23/1.23 /1.23/1.4	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_3M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/875.5	---	1.23/1.23 /1.23/3	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_3M_M	M	3*C(15W) 1*L(15W)	878.67/879.9/ 881.13/884	---	1.23/1.23 /1.23/3	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_3M_T	T	3*C(15W) 1*L(15W)	887.07/888.3/ 889.53/892.5	---	1.23/1.23 /1.23/3	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_5M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/876.5	---	1.23/1.23 /1.23/5	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_5M_M	M	3*C(15W) 1*L(15W)	877.77/879/88 0.23/884	---	1.23/1.23 /1.23/5	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_5M_T	T	3*C(15W) 1*L(15W)	885.27/886.5/ 887.73/891.5	---	1.23/1.23 /1.23/5	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_10M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/879	---	1.23/1.23 /1.23/10	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_10M_T	T	3*C(15W) 1*L(15W)	879.87/881.1/ 882.33/889	---	1.23/1.23 /1.23/10	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_15M_B	B	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/881.5	---	1.23/1.23 /1.23/15	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_15M_T	T	3*C(15W) 1*L(15W)	875.07/876.3/ 877.53/886.5	---	1.23/1.23 /1.23/15	41.76/41.76/4 1.76/41.76	CL/TM1.2
3C1L_1XEVD0_20M_M	M	3*C(15W) 1*L(15W)	870.03/871.26 /872.49/884	---	1.23/1.23 /1.23/20	41.76/41.76/4 1.76/41.76	CL/TM1.2

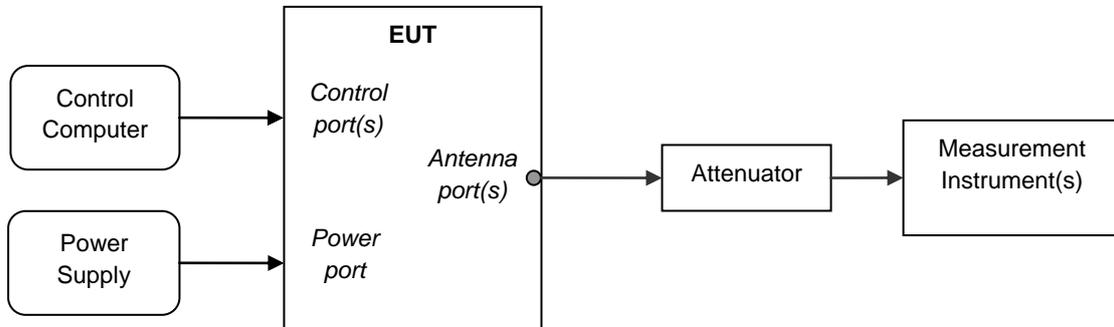


### 4.3 Test Environments

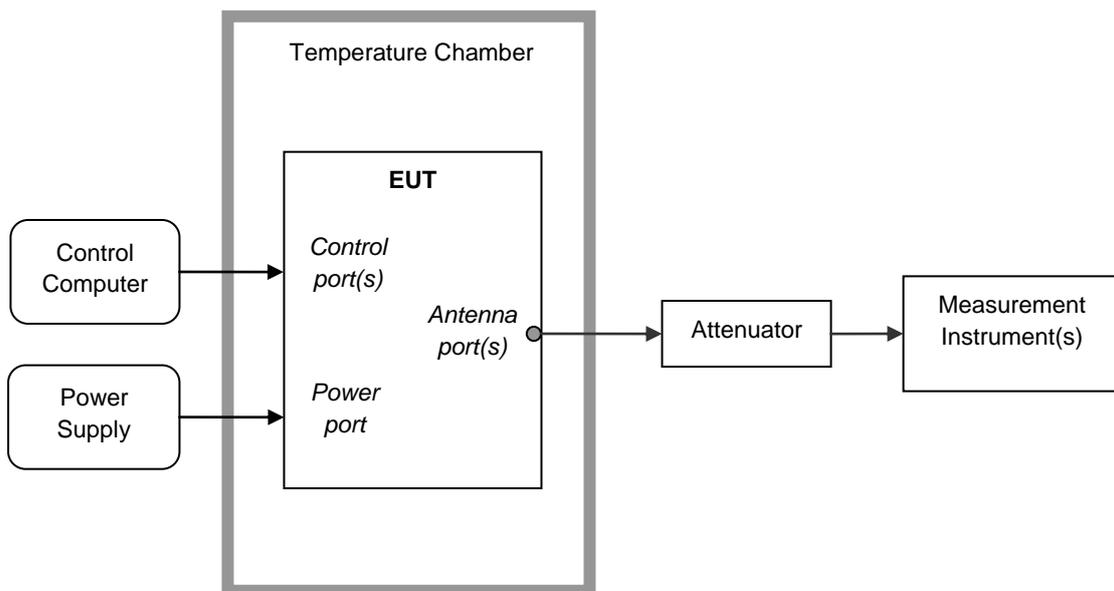
Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
Ambient Climate	Ambient	---	Ambient
Rated Voltage	---	-48 VDC	---

## 4.4 Test Setups

### 4.4.1 Test Setup 1



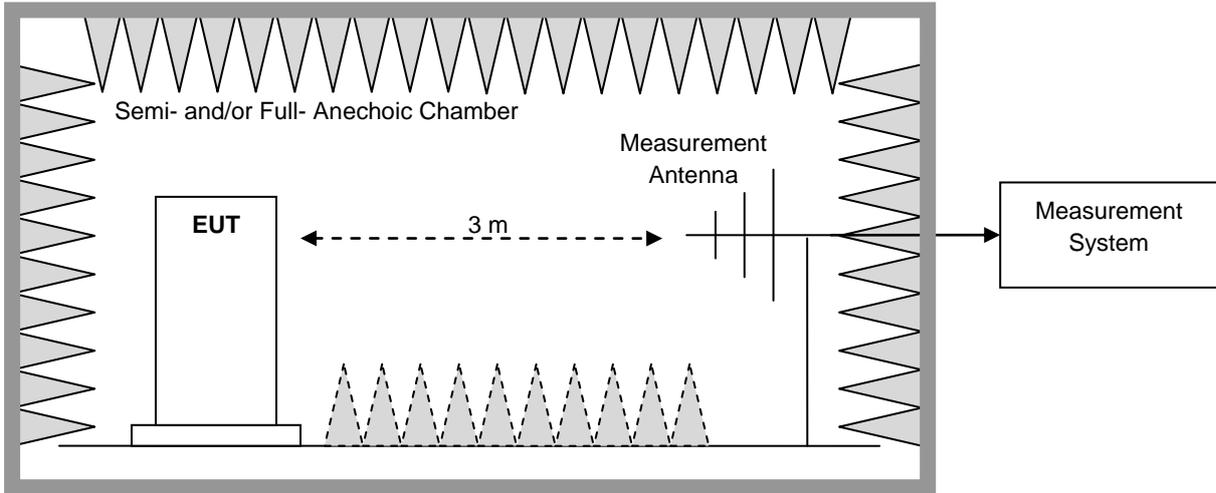
### 4.4.2 Test Setup 2



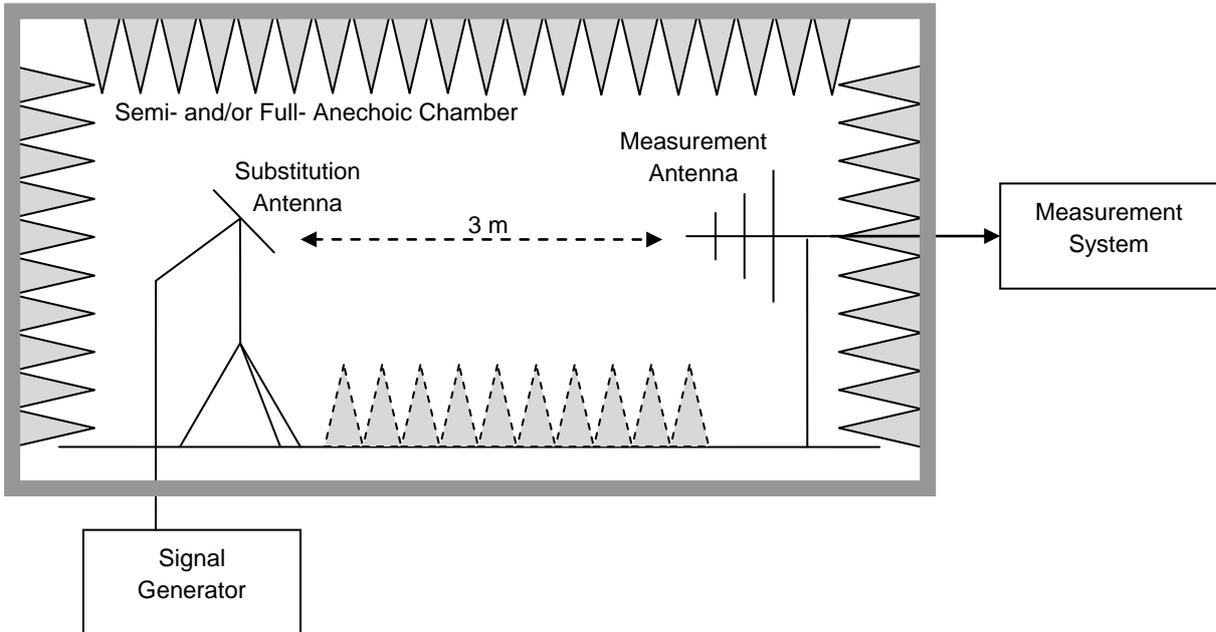
### 4.4.3 Test Setup 3

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

#### 4.4.3.1 Step 1: Pre-test



**4.4.3.2 Step 2: Substitution method to verify the maximum ERP**



#### 4.5 Test Conditions

Test Case		Test Conditions	
Transmitter Output Power	Average Power, Total	Test Environment	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Configuration	1C_1X_B , 1C_1X_M , 1C_1X_T 3C_1X_B , 3C_1X_M , 3C_1X_T 4C_1X_B , 4C_1X_M , 4C_1X_T 1C_1XEVD0_B , 1C_1XEVD0_M , 1C_1XEVD0_T 3C_1XEVD0_B , 3C_1XEVD0_M , 3C_1XEVD0_T 4C_1XEVD0_B , 4C_1XEVD0_M , 4C_1XEVD0_T 1L_1M4_B , 1L_1M4_M , 1L_1M4_T 1L_3M_B , 1L_3M_M , 1L_3M_T 1L_5M_B , 1L_5M_M , 1L_5M_T 1L_10M_B , 1L_10M_M , 1L_10M_T 1L_15M_B , 1L_15M_T 1L_20M_B , 1L_20M_T 3C1L_1X_1M4_B , 3C1L_1X_1M4_M , 3C1L_1X_1M4_T 3C1L_1X_3M_B , 3C1L_1X_3M_M , 3C1L_1X_3M_T 3C1L_1X_5M_B , 3C1L_1X_5M_M , 3C1L_1X_5M_T 3C1L_1X_10M_B , 3C1L_1X_10M_T 3C1L_1X_15M_B , 3C1L_1X_15M_T 3C1L_1X_20M_M 3C1L_1XEVD0_1M4_B , 3C1L_1XEVD0_1M4_M , 3C1L_1XEVD0_1M4_T 3C1L_1XEVD0_3M_B , 3C1L_1XEVD0_3M_M , 3C1L_1XEVD0_3M_T 3C1L_1XEVD0_5M_B , 3C1L_1XEVD0_5M_M , 3C1L_1XEVD0_5M_T 3C1L_1XEVD0_10M_B , 3C1L_1XEVD0_10M_T 3C1L_1XEVD0_15M_B , 3C1L_1XEVD0_15M_T 3C1L_1XEVD0_20M_M
Modulation Characteristics	Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 1
		EUT Configuration	1C_1X_M 1L_20M_M  NOTE: An arbitrary EUT configuration was selected to demonstrate compliance.
Bandwidth	99% Occupied Bandwidth	Test Environment	Ambient Climate & Rated Voltage
		Test Setup	Test Seup 1
		EUT Configuration	1C_1X_B , 1C_1X_M , 1C_1X_T 1C_1XEVD0_B , 1C_1XEVD0_M , 1C_1XEVD0_T



Test Case		Test Conditions		
			1L_1M4_B , 1L_1M4_M , 1L_1M4_T 1L_3M_B , 1L_3M_M , 1L_3M_T 1L_5M_B , 1L_5M_M , 1L_5M_T 1L_10M_B , 1L_10M_M , 1L_10M_T 1L_15M_B , 1L_15M_T 1L_20M_B , 1L_20M_T	
		Emission	Test Environment	Ambient Climate & Rated Voltage
		Bandwidth	Test Setup	Test Seup 1
		(if required)	EUT Configuration	Not applicable
Band Edges Compliance		Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 1	
		EUT Configuration	1C_1X_B , 1C_1X_T 4C_1X_B , 4C_1X_T 1C_1XEVD0_B , 1C_1XEVD0_T 4C_1XEVD0_B , 4C_1XEVD0_T 1L_1M4_B , 1L_1M4_T 1L_3M_B , 1L_3M_T 1L_5M_B , 1L_5M_T 1L_10M_B , 1L_10M_T 1L_15M_B , 1L_15M_T 1L_20M_B , 1L_20M_T 3C1L_1XEVD0_1M4_B , 3C1L_1XEVD0_1M4_T 3C1L_1XEVD0_20M_M	
Spurious Emission at Antenna Terminals		Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 1	
		EUT Configuration	1C_1X_B , 1C_1X_M , 1C_1X_T 3C_1X_B , 3C_1X_M , 3C_1X_T 4C_1X_B , 4C_1X_M , 4C_1X_T 1C_1XEVD0_B , 1C_1XEVD0_M , 1C_1XEVD0_T 3C_1XEVD0_B , 3C_1XEVD0_M , 3C_1XEVD0_T 4C_1XEVD0_B , 4C_1XEVD0_M , 4C_1XEVD0_T 1L_1M4_B , 1L_1M4_M , 1L_1M4_T 1L_3M_B , 1L_3M_M , 1L_3M_T 1L_5M_B , 1L_5M_M , 1L_5M_T 1L_10M_B , 1L_10M_M , 1L_10M_T 1L_15M_B , 1L_15M_T 1L_20M_B , 1L_20M_T 3C1L_1XEVD0_1M4_B , 3C1L_1XEVD0_1M4_M , 3C1L_1XEVD0_1M4_T 3C1L_1XEVD0_20M_M	
Field Strength of Spurious Radiation		Test Environment	Ambient Climate & Rated Voltage	
		Test Setup	Test Seup 3	
		EUT Configuration	2C_1X_M	



Test Case	Test Conditions	
		NOTE: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.
Frequency Stability	Test Environment	(1) -30 °C to +50 °C with step 10 °C at Rated Voltage; (2) 85%, 100% and 115% of Rated Voltage at Ambient Climate.
	Test Setup	Test Seup 2
	EUT Configuration	1L_20M_M  NOTE: A representative EUT configuration was selected since the un-modulation carrier configuration was required by the standards/rules.
Receiver Spurious Emissions, Conducted (Only for IC requirement)	Test Environment	Ambient Climate & Rated Voltage
	Test Setup	Test Seup 1
	EUT Configuration	Not applicable



## 5 Test Results

No.	Test Item	Test Result
1	Transmitter Output Power	Appendix A
2	Modulation Characteristics	Appendix B
3	Occupied Bandwidth	Appendix C
4	Band Edges Compliance	Appendix D
5	Spurious Emission at Antenna Terminals	Appendix E
6	Field Strength of Spurious Radiation	Appendix F
7	Frequency Stability	Appendix G
8	Receiver Spurious Emissions, Conducted (Only for IC requirement)	Appendix H
9	Photos of Test Setups	Appendix I



## 6 Main Test Instruments

Equipment Name	Manufacturer	Model	Serial Number	Cal. Due
Test Setup 1 & 2				
Spectrum Analyzer	R&S	FSQ40	100025	2012-10-19
Spectrum Analyzer	Agilent	N9020A	MY50110169	2012-09-19
Spectrum Analyzer	Agilent	N9030A	MY49431033	2013-05-02
Temperature Chamber	ESPEC	EW2465	05175004	2012-07-25
Test Setup 3				
3m Semi Anechoic Chamber	S+M	---	---	---
EMI Test receiver	R&S	ESU40	100144	2013-05-13
Broadband Antenna	SCHAFFNER	CBL6112B	2747	2013-01-12
Horn Antenna	R&S	HF906	359287/005	2014-03-23



## 7 Measurement Uncertainty

For a 95% confidence level ( $k = 2$ ), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
Transmitter Output Power	Power [dBm]	U = 0.39 dB
Bandwidth	Magnitude [%]	U = 0.2%
Band Edge Compliance	Disturbance Power [dBm]	U = 2.0 dB
Spurious Emissions, Conducted	Disturbance Power [dBm]	U = 2.0 dB
Field Strength of Spurious Radiation	ERP [dBm]	For 3 m Chamber: U = 4.6 dB (30 MHz to 1GHz) U = 3.0 dB (above 1 GHz) For 10 m Chamber: U = 4.6 dB (30 MHz to 1GHz) U = 3.0 dB (above 1 GHz)
Frequency Stability	Frequency Accuracy [ppm]	U = 0.21 ppm

END